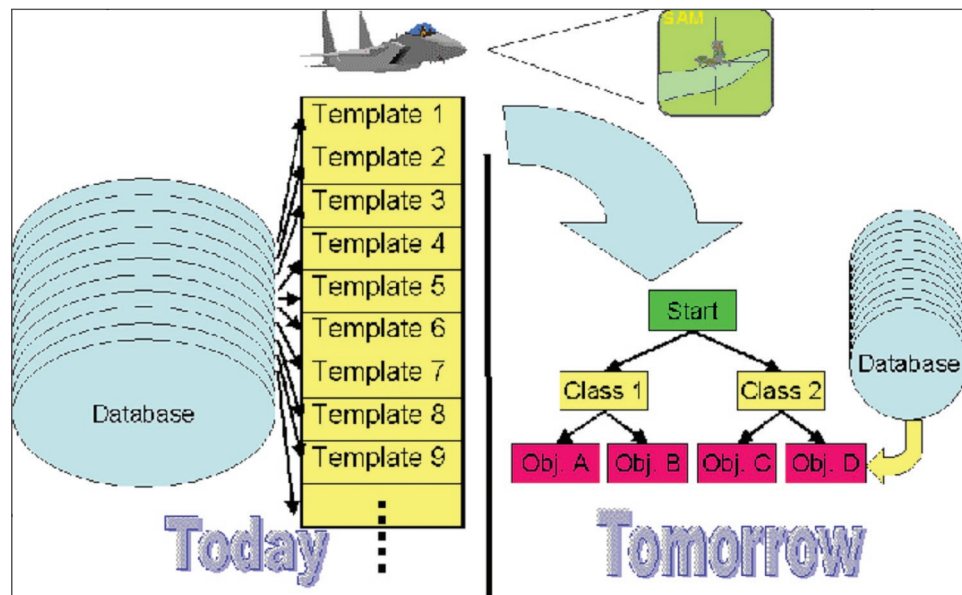# Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

ALGORITHM DECREASES COMPUTATIONAL TIME TO PERFORM COMBAT IDENTIFICATION

The Sensors Directorate Automatic Target Recognition (ATR) Team has invented a revolutionary detection and recognition process that matches potential battlefield targets to known targets in Air Force databases in a fast, automated process.

Accomplishment

By understanding the fundamental relationship between objects and images and constructing a metric or measurement for comparing objects to images, the ATR Team created an algorithm that dramatically decreases the amount of computational time necessary to perform combat identification (CID). CID is the process of attaining an accurate characterization of detected objects in the joint battlespace to the extent that high confidence, timely application of military options and weapons resources can occur. A computer will watch all video cameras, radars, and other Air Force sensor platforms, aiding the pilot or intelligence analyst by letting them concentrate on the task at hand.

Object-image relations (OIR) indicate when an object and image are consistent. OIRs help to answer questions about what objects could have produced a specific image. An object-image metric indicates how to measure the distance between images, the distance between objects, and the distance between an object and an image. This metric will affect both the overall ATR algorithm approach as well as the implementation of many components of the algorithm.

Background

The new process avoids item-by-item searches through huge databases in order to find a match for a potential target. Past systems comprised very large databases of pictures and objects that must be created, maintained, and searched sequentially for potential matches. The new system will hold the same amount of information as the original database but will be dramatically smaller.

Sensors
Emerging Technologies

Additional information